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# Frontmatter for PROCEEDINGS OF THE FOURTEENTH NORTH AMERICAN CRANE WORKSHOP, 11-15 January 2017 Chattanooga, Tennessee

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# PROCEEDINGS OF THE FOURTEENTH NORTH AMERICAN CRANE WORKSHOP



11-15 January 2017  
Chattanooga, Tennessee



**FRONTISPIECE.** Tom Stehn (left), retired U.S. Fish and Wildlife Service biologist at Aransas National Wildlife Refuge and former U.S. Whooping Crane Recovery Team Leader, received the L. H. Walkinshaw Crane Conservation Award in recognition of his career-long work in both field and leadership roles in whooping crane conservation. Tom received his M.S. degree from the University of Montana in 1973 and then started his career in wildlife biology in Iowa. After a Peace Corps position in Africa, he joined the Service in 1980 at the McFaddin National Wildlife Refuge, Texas, and transferred to Aransas 2 years later. In 2011 he retired after 31 years, including 15 years as Aransas biologist followed by 14 years as U.S. Whooping Crane Coordinator. Under Tom's careful watch and documentation, the Aransas-Wood Buffalo population grew from 71 to 283 birds. His knowledge of the population through extensive winter surveys and observations at Aransas, as well as participation in radiotracking the cranes to Canada and production surveys in Wood Buffalo National Park, form the basis for our knowledge of the population and its required management and conservation. The current flock is a testament to his work, which we hope will be a foundation for continued protection and growth of the population. The Award was presented by NACWG Board members Richard Urbanek, Barry Hartup (center), and George Archibald (right) on 13 January 2017. Thanks to photographer Ted Thousand and Todd Persche for print and framing. (Photo by Glenn Olsen)

*Front cover:* Whooping cranes and sandhill cranes wintering at Wheeler National Wildlife Refuge, Alabama, by George Lee.

*Back cover:* Scenes from the Fourteenth Workshop in Chattanooga, Tennessee, and field trips to Hiwassee Wildlife Refuge and Wheeler NWR by David Aborn, William R. Gates, Chris Gullikson, George Lee, Glenn Olsen, Russ Thompson, and Richard Urbanek.

**PROCEEDINGS OF THE  
FOURTEENTH NORTH AMERICAN  
CRANE WORKSHOP**

**11-15 January 2017  
Chattanooga, Tennessee, USA**

*Editors*  
**JANE E. AUSTIN  
and  
RICHARD P. URBANEK**

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## PREFACE

The North American Crane Working Group (NACWG) is an organization of professional biologists, aviculturists, land managers, non-professional crane enthusiasts, and others interested in and dedicated to the conservation of cranes and crane habitats in North America. Our group meets approximately every 3 years to exchange information pertaining to sandhill cranes and whooping cranes and occasionally reports about some of the other cranes species. The NACWG held the 14th North American Crane Workshop in Chattanooga, Tennessee, on 12-13 January 2017 preceded on 11 January by a social at the Chattanooga Zoo, and followed by field trips to nearby Hiwassee Wildlife Refuge on 14 January and to Wheeler National Wildlife Refuge (near Decatur, Alabama) on 15 January. The field trips coincided with the crane festivals held annually at both sites. Board member David Aborn did an outstanding job with local planning and arrangements. There were 70 registrants. The scientific program consisted of 37 oral and 14 poster presentations on North American cranes. Both field trip locations are major wintering areas for sandhill cranes and whooping cranes, and unusually warm weather resulted in great viewing.

The L. H. Walkinshaw Crane Conservation Award, NACWG's highest honor, was presented to Tom Stehn (Frontispiece). A special Award of Recognition was presented to local resident Ken Dubke, who was instrumental in Hiwassee Wildlife Refuge becoming a major sandhill crane migration stopover and wintering area and in raising historical awareness that led to creation of the Cherokee Removal Memorial. For many years Ken organized the annual Sandhill Crane and Cherokee Heritage Festival. During the NACWG business meeting, members voted to increase the size of the NACWG Board of Directors to 11 members, including a student representative; these currently include President Richard Urbanek, Vice-president Sammy King, Treasurer Barry Hartup, Secretary Daryl Henderson, David Aborn, Tommy Michot, Glenn Olsen, and new members George Archibald, Megan Brown, Paige Smith, and Hillary Thompson.

The papers in these Proceedings represent 8 presentations from the workshop and 10 manuscripts submitted later. Abstracts of oral and poster presentations for which a paper is not published here are included at the end of the volume. Papers submitted for publication in the Proceedings are peer-reviewed according to scientific journal standards. We thank the following referees for their contribution to the quality of this volume:

Ken F. Abraham, Jeb A. Barzen, David A. Brandt, Daniel P. Collins, Timothy A. Dellinger, Bruce D. Dugger, Taylor A. Finger, David L. Fronczak, Jeremy E. Guinn, Matthew A. Hayes, Jerome J. Howard, Gary L. Ivey, Eileen M. Kirsch, Susan N. Knowles, Anne E. Lacy, James R. Lovvorn, Robert G. McLean, Misty E. McPhee, Kim A. Miller, Neal D. Niemuth, Lovisa Nilsson, Gunter Nowald, Glenn H. Olsen, David Olson, Aaron T. Pearse, Brandon S. Reishus, Lisa A. Shender, Andrew P. Stetter, Thomas V. Stehn, Eva K. Szyszkoski, Josh L. Vest, Scott J. Werner, Brook J. Wilke, Jeffrey R. Wozniak, and Sara E. Zimorski.

Daryl S. Henderson and Sara E. Zimorski were instrumental in final editing and proofing.

This volume retains use of the genus *Grus* for 4 crane species (sarus, brolga, white-naped, and sandhill). Until analysis of nuclear DNA supports reclassification, the NACWG will continue to endorse the conclusions of Krajewski et al. (2010, *Auk* 127:440-452) and Krajewski (2018, Chapter 2 in *Whooping Cranes: Biology and Conservation*, Academic Press). Krajewski (personal communication, 2016) considers recent reclassification to the genus *Antigone* to be premature.

*Jane Austin and Richard Urbanek, Editors*  
*October 2018*



**ROBERT H. HORWICH**  
**1940-2017**

Dr. Rob Horwich received a B.S. from Rutgers University and M.S. and Ph.D. degrees from the University of Maryland. His career spanned a post-doctoral appointment in India from the Smithsonian Institute, directing the Maryland House Natural History Museum, and researching infant primate development at the Brookfield Zoo. At the International Crane Foundation during the mid-1980s, Rob pioneered methods to rear crane chicks by costumed humans in isolation from human sights, sounds, and activity to produce cranes suitable for reintroduction. These techniques made possible adequate numbers of high-quality birds for release as well as facilitated management of birds after release. Costume-rearing has since gone on to form the basis of endangered species conservation projects, including release of hundreds of whooping cranes in the eastern United States.

In 1989 Rob founded Community Conservation, Inc., which promotes global biodiversity and sustainable land use by empowering local people to manage and conserve natural resources within the social, cultural, and economic context of their own communities. He remained active in this organization until his death. He was instrumental in creation of the Kickapoo Valley Reserve near his home in Wisconsin. In Belize, Rob refocused his efforts from academic research on howler monkeys to conservation and worked with local people to create the Community Baboon Sanctuary, which became a world-renowned model for conservation. In India, he catalyzed interest in the golden langur, and the project grew into a federation of 130 villages conserving forests for this endangered monkey. Rob called this process “conservation contagion,” and he persisted tirelessly to hasten its spread. In 15 countries he worked with 200 communities to conserve 1.5 million acres. Rob became ill after returning from work with local communities in Cameroon to conserve habitat for the Cross River gorilla, of which only a few hundred remain; he died on 7 February 2017. He will be greatly missed, but as a result of his insightful initiatives, a global network of inspired people are in place to carry on his work.

*(Photo by David Ellis)*



**WILLIAM A. LISHMAN**  
**1939-2017**

Bill Lishman grew up on a dairy farm near Pickering, Ontario. An inventor, aviator, environmentalist, architect, author, photographer, and filmmaker, he was a Renaissance man who thought and lived outside the box. He became a well-known metal sculptor with works ranging from small pieces to numerous massive public exhibits, all unique and unusual. He designed and built his family's underground home consisting of large rooms with domed, skylighted ceilings.

Bill was a pioneer of ultralight aircraft in Canada. He was the first person to teach birds to fly in formation and the first to use aircraft to lead birds in migration along a planned route to a predetermined wintering area. This reintroduction technique later became the primary means to reintroduce a population of migratory whooping cranes into eastern North America and has been emulated in other projects worldwide. He initially taught Canada geese to follow ultralight aircraft near his home at Purple Hill, Ontario, in 1988. This was followed by the first ultralight-led migrations from Ontario to Virginia in 1993 and Ontario to South Carolina in 1994. Flying with geese was documented in his autobiography *Father Goose*, which inspired the fictional feature film *Fly Away Home* in which Bill and his family and associates participated in production. In 1994 Bill co-founded Operation Migration (OM), Inc., with Joe Duff. OM completed work with geese in 1995 and began training sandhill cranes in the same year. Continued work with sandhill cranes included ultralight-led migrations from Ontario to Virginia in 1997 and Wisconsin to Florida in 2000. The latter route was a test run for the reintroduction of whooping cranes, which began the following year. OM flew 15 migrations with whooping cranes and provided the primary method for adding cranes to the eastern population during that period.

Bill died on 30 December 2017 with his family present in the house that he had built. His good nature and productive creativity across multiple fields were inspirational and unmatched.

*(Photo by Peter Cheney)*





**THEODORE A. BOOKHOUT**  
**1931-2018**

Dr. Ted Bookhout was originally from Salem, Illinois. He attended Southern Illinois University, where he received his B.A. in Botany in 1952 and M.S. in Zoology in 1954. After being drafted and serving in the U.S. Army as a biologist in Maryland, he conducted his doctoral research on snowshoe hares in the Upper Peninsula of Michigan. Ted earned his Ph.D. degree in Wildlife Management from the University of Michigan in 1963. Shortly thereafter, he became Leader of the Ohio Cooperative Wildlife (later Fish and Wildlife) Research Unit at Ohio State University, where he was Professor of Zoology and of Natural Resources until his retirement in 1996. Research by Ted and his graduate students concentrated on wetlands, waterfowl, surface mine ecology, and endangered species. Ted was active in The Wildlife Society throughout his career, serving as President, editor of *The Journal of Wildlife Management*, and editor of the fifth edition of the *Wildlife Techniques Manual*; he was named a TWS Fellow in 2012.

In 1983, when the U.S. Fish and Wildlife Service was considering establishment of a population of whooping cranes in eastern U.S., Ted proposed Upper Michigan as a reintroduction site, where he had research ongoing with yellow rails on Seney National Wildlife Refuge. With field work beginning in 1984, he supervised a decade-long series of projects based at Seney, first with study of the abundance, reproduction, migration, and wintering of the local sandhill cranes, followed by studies in adjacent Ontario, development of costume-rearing and gentle release reintroduction techniques, and habitat use.

Ted died on 26 February 2018 in Columbus, Ohio. His many graduate students spread far and wide within the field of wildlife biology during his lifetime. The conservation community has lost a dedicated and respected professional. The crane community has lost a pioneer whose groundwork laid the foundation for many of the accomplishments that have followed. Many of us have lost a major professor, supervisor, mentor, and friend.

*Richard Urbanek, New Lisbon, Wisconsin*



**JAMES T. HARRIS**  
**1950-2018**

On 19 September 2018 our friend and colleague, Jim Harris, passed away after an 8-month battle with liver and pancreatic cancer. Jim spent 34 years working for the International Crane Foundation (ICF), serving first as Director of Public Education, then as Deputy Director expanding activities in Asia, as President from 2000 to 2006, before transitioning back to serve as Vice President for ICF's East Asia program and overseeing the Africa program. He served as Chair of the IUCN Crane Working Group from 2008 until his retirement in 2017, where his infectious enthusiasm and commitment inspired the participation by scientists from all corners of the globe. Jim led many workshops that brought diverse people together to address the complex challenges in crane conservation. His writing and editing skills are evident in the many workshop proceedings and articles, both technical and popular, and have helped to inspire and build a global crane conservation community.

Jim was amazing in the field; he could recount the most minute details of virtually every bird species encountered and he was an encyclopedia of bird distributions in China. Jim's impact on crane conservation is significant, but in Asia in particular, it is immeasurable. Although he could not speak Chinese, his passion for natural resources and his love for people transcended the language barrier and he garnered deep respect from his Asian colleagues. He was able to approach culturally sensitive issues and develop innovative conservation solutions because of his sensitivity to others, his political acumen, and his conservation vision. One of the most memorable aspects of Jim was his deep, infectious laugh; it transcended languages and moods and its memory still brings joy. We lost an important and influential conservation colleague, but most importantly, we lost a dear friend. We cannot let his work be in vain, however, and we must continue to love cranes and people.

*Sammy King, Baton Rouge, Louisiana; George Archibald, Baraboo, Wisconsin; and Jane Austin, Iron River, Wisconsin (Photo by Kerry Morrison)*

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